

WHAT IS CLAIMED IS:

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1. A receiver which demodulates an Orthogonal Frequency Division Multiplexing symbol transmitted by an Orthogonal Frequency Division Multiplexing method, comprising:

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a delay profile generation unit which generates a delay profile regarding a preceding wave and a delayed wave which are included in a received signal;

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a demodulation unit which demodulates said received signal so as to output a demodulated signal per sub-carrier;

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a hard-decision unit which makes a hard decision per sub-carrier on a signal point based on said demodulated signal so as to output a hard-decision signal;

a replica generation unit which uses the hard-decision signal to generate a replica signal per sub-carrier; and

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an inter-carrier interference suppression unit which adds a difference between said hard-decision signal and said replica signal to said demodulated signal so as to suppress an inter-carrier interference;

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wherein said replica generation unit comprises:

a time-domain received signal generation unit which inverse-Fourier transforms said hard-decision signal so as to generate a received signal in time domain;

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a signal component suppression unit which suppresses, by using a preceding symbol that is an already-demodulated OFDM symbol which

precedes a target demodulating symbol that is a target OFDM symbol to be demodulated, a signal component of said preceding symbol which is included in said delayed wave;

5           a modified received signal generation unit which adds, before said target demodulating symbol in said delayed wave, a portion of said received signal in said time domain; and

10           a replica signal generation unit which generates said replica signal by Fourier-transforming said modified received signal.

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2. The receiver as claimed in claim 1, wherein said hard-decision unit is adapted to make the hard decision per sub-carrier on the signal point based on a signal in which said demodulated signal and the demodulated signal in another diversity branch are combined so as to output the hard-decision signal.

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3. The receiver as claimed in claim 1, wherein said hard-decision unit comprises:

30           a decoding unit which error-correction decodes said demodulated signal;

          a decision unit which makes the hard decision per sub-carrier on an error-correction decoded signal point; and

35           an output unit which error-correction decodes the hard-decision result so as to

output said hard-decision signal.

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4. The receiver as claimed in claim 1, further comprising a multi-stage processing route which performs a series of processing including generation of the hard-decision signal, generation of the replica signal, and suppression of the inter-carrier interference.

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5. The receiver as claimed in claim 1, further comprising a modified received signal generation unit which further adds a portion of a known signal which is received per predetermined number of OFDM symbols before the demodulated symbol of said delayed wave so as to generate the modified received signal.

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6. The receiver as claimed in claim 1, wherein said received signal is modified so as to make signal contents of a portion preceding the target demodulating symbol, which is included in the delayed wave, equal to said portion of the received signal in the time domain.

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7. A receiver which demodulates an Orthogonal Frequency Division Multiplexing symbol transmitted by an Orthogonal Frequency Division Multiplexing method, comprising:

5           a delay profile generation unit which generates a delay profile regarding a preceding wave and a delayed wave which are included in a received signal;

          a signal component suppression unit  
10 which suppresses, by using a preceding symbol that is an already-demodulated OFDM symbol which precedes a target demodulating symbol that is a target OFDM symbol to be demodulated, a signal component of said preceding symbol which is  
15 included in said delayed wave;

          a demodulation unit which demodulates said received signal so as to output a demodulated signal per sub-carrier;

          a hard-decision unit which makes a  
20 hard decision per sub-carrier on a signal point based on said demodulated signal so as to output a hard-decision signal;

          a replica generation unit which uses the hard-decision signal to generate a replica  
25 signal per sub-carrier; and

          an inter-carrier interference suppression unit which adds a difference between said hard-decision signal and said replica signal to said demodulated signal so as to  
30 suppress an inter-carrier interference;

          wherein said replica generation unit comprises:

          a time-domain received signal generation unit which inverse-Fourier transforms  
35 said hard-decision signal so as to generate a received signal in time domain;

          a modified received signal generation

unit which adds, before said target demodulating symbol in said delayed wave, a portion of said received signal in said time domain; and

5 a replica signal generation unit which generates said replica signal by Fourier-transforming said modified received signal.

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8. The receiver as claimed in claim 7, wherein said hard-decision unit is adapted to make the hard decision per sub-carrier on the signal point based on a signal in which said demodulated signal and the demodulated signal at another diversity branch are combined so as to output the hard-decision signal.

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9. The receiver as claimed in claim 7, wherein said hard-decision unit comprises:

a decoding unit which error-correction decodes said demodulated signal;

30 a decision unit which makes the hard decision per sub-carrier on an error-correction decoded signal point; and

an output unit which error-correction decodes the hard-decision result so as to output said hard-decision signal;

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10. The receiver as claimed in claim 7,  
further comprising a multi-stage processing route  
which performs a series of processing including  
5 the generation of the hard-decision signal, the  
generation of the replica signal, and the  
suppression of the inter-carrier interference.

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11. The receiver as claimed in claim 7,  
further comprising a modified received signal  
generation unit which further adds, before the  
15 demodulated symbol in said delayed wave, a  
portion of a known signal which is received per  
predetermined number of OFDM symbols.

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12. The receiver as claimed in claim 7,  
wherein said received signal is  
modified so as to make signal contents of a  
25 portion preceding the target demodulating symbol,  
which is included in the delayed wave, to be  
equal to said portion of the received signal in  
the time domain.

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